Oxalis pes-caprae L. (Oxalidaceae)
Bermuda Buttercup

Description. Perennial, somewhat succulent; stems 10-20 cm long, erect but subterranean, fleshy, producing white to light brown bulbs near the base and above the roots. Leaves in a basal rosette, compound, petiolate, with 3 leaflets, leaflets 10-30 mm mm long, green, often spotted, usually obcordate, folding lengthwise at night. Flowers 3-20, bisexual, radial, in an umbel, the peduncle 10-30 cm long. Sepals 5, distinct, lanceolate to oblong, petals 5, 15-25 mm long, somewhat united at the base, yellow, stamens 10, in two sets, five long and 5 short, the filaments pilose; ovary superior, with 5 locules, 5 style branches. In California flowering from February to May, but not producing seeds (plants in California apparently sterile). (Munz 1959, Ornduff 1993, Valentine 1968, Webb et al 1988).

Synonym= *Oxalis cernua* Thunberg.

Geographic distribution. A native of southern Africa, Bermuda buttercup has become naturalized in Great Britain, Mediterranean Europe, California, Chile, Australia, and New Zealand. (Chapman 1991, Galil 1968, Michael 1964, Munz 1959, Ornuduff 1987, Valentine 1968, Webb et al 1988).

Bermuda buttercup was first reported (as *O. cernua*) in the early 20th century as a weed in orchards (Robbins 1940). It has been reported from Santa Cruz Island (Junak et al. 1997) and occurs throughout most California coastal counties (Anonymous 1998, Ornduff 1993).

Reproductive and vegetative biology. *Oxalis pes-caprae* is heterostylous and self-incompatible (Ornduff 1974, 1987). Populations in South Africa are tristylous (composed of three different floral forms with style and stamen lengths corresponding to 3 different levels). Sexual populations are either diploid or tetraploid, but a sterile, pentaploid race is believed derived from diploid X tetraploid hybrids. Although sexual plants can be weedy, the sterile pentaploid is apparently the only race that has become widespread outside of South Africa (Michael 1964, 1965, Ornduff 1987), spreading entirely by bulblets formed at the base of the succulent stem (Galil 1968, Peirce 1973, Putz 1994).

Seeds of the diploid and tetraploid forms require a light stimulus for germination, which is enhanced by warm, moist conditions and require light (Marshall 1987, Peirce 1973). The primary mode of reproduction, however, are bulbs produced by subterranean stems.

In the presence of spring rains, bulbs of the sterile pentaploid produce roots and young shoots within 4 to 6 weeks (Lane 1984). Each bulb develops two different subterranean stem systems, one vertical, the other horizontal (Galil 1968). The vertical stem gives rise to the aerial shoot system and may also produce axillary buds that develop into bulbs. The horizontal stem grows laterally by means of contractile roots. At maturity the horizontal stem becomes a storage organ (water, nutrients) and develops a terminal bulb immediately above the roots. Both kinds of stems can develop adventitious roots (Galil 1968), especially if damaged or cut by disturbance (e.g., plowing, digging). Mature plants may produce up to 20 bulblets, most of which are dispersed from the parent plant at the end growing season (Galil 1964, 1968, Putz 1994). Bulbs are sensitive to freezing, but can persist for more than 3 years in a vegetative condition if kept dry (Marshall 1987). Cultivation and redistribution of soils are the most prevalent means of bulb

dispersal (Galil 1968, Paspatis 1985), but birds and and mole rats (in South Africa) also disperse the bulbs (Galil 1967, Young 1958).

Bermuda buttercup has been found to be toxic to livestock (Rekhis 1994).

Ecological distribution. Bermuda buttercup occurs in cultivated and fallow fields, irrigation ditches, along roadsides, and open sites (Galil 1968, Hildreth and Agamalian 1985, Munz 1959, Ornduff 1993).

Weed status. *Oxalis pes-caprae* is not considered a serious weed in agricultural or horticultural practice, at least at a global level (not listed by Holm et al. 1977), nor is it considered a noxious weed by the State Dept. of Food and Agriculture (Anonymous 1996). It is not listed for the United States in Lorenzi and Jeffery (1987).

Microbial pathogens. No literature was found that reported microbial pathogens of *Oxalis pes-caprae*.

Insect pathogens. The noctuid moth, *Klugeana philoxalis*, selectively feeds on bermuda buttercup and has been recommended as a biocontrol in South Africa (Kluge and Claasens 1990).

Herbicide control. Hildreth and Agamalian (1985) recommended the use of oxyflourflen in California artichoke fields. The most effective long-term treatment was found to be associated with initial appearnace of shoots from single bulbs. Other herbicide treatments, including 2,4-D and glyphosate, have been evaluated but their use was inneffective at levels considered to be safe for cultivated grapes and other perennial crops (Marshall 1987, Michael 1965, Paspatis 1985).

Other control methods. Bermuda buttercup is a host to broomrape (*Orobanche* sp.), which selectively infests herbaceous plants in Greek vineyards (Paspatis 1985).

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